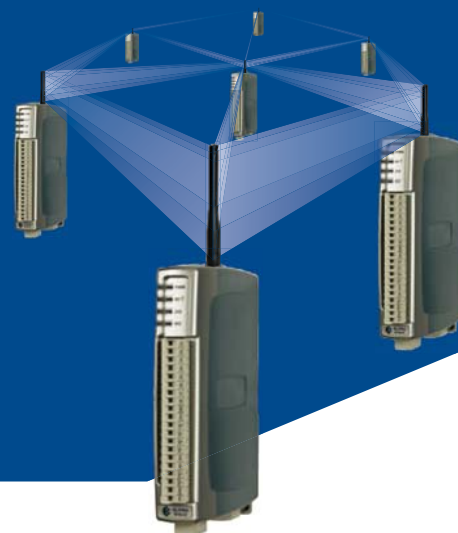


915U-2 WIRELESS MESH I/O & GATEWAY

Reliable, secure, scalable communications

ELPRO's 915U-2 combines multi I/O and/or gateway functionality with the reliability of secure, scalable, mesh distance communications.

Featuring ELPRO WIBMesh™ technology, the 915U-2 IP based addressing provides mesh/self healing of network communications, multi-hop repeating and remote over the air re-configuration and diagnostics. The 915U-2 is further complemented by its ease of commissioning and integration into existing plant infrastructure.



ELPRO TECHNOLOGIES

Industrial Wireless Technology

Product Features

- 902-928MHz*, FHSS, IP based, wireless mesh technology to 115kbps.
- Self-healing, repeatable, secure communications to 128bit AES
- User friendly operation with self discovery of radio path and expansion I/O.
- Remote over the air re-configuration, firmware upgrade and fault analysis.
- Scalable, simple to complex, point to multipoint network design.
- Gather-Scatter™/Block mapping technology for ease of system integration.
- Cost effective I/O and/or gateway functionality via feature key upgrade.
- System wide view, localized I/O referencing, printing/exporting of configuration.

* Country specific sub-bands option availability.

Application Examples

Monitoring, control and reporting for:

- Pharmaceutical production
- Oil/Gas field production/distribution
- Mining production and refining
- Water/Waste water infrastructure
- Utilities distribution & custody transfer
- Aquaculture/agriculture production
- Pulp and paper mill manufacture
- Road/rail network management



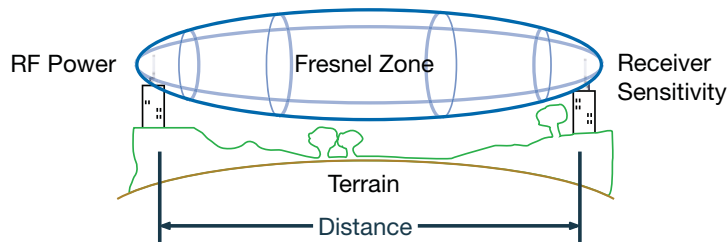
THINK WIRELESS... THINK ELPRO

915U-2 Meshed Multi I/O & Gateway

Reliable, secure, 900MHz, FHSS, wireless mesh communications.

Combining the best of wireless technologies.

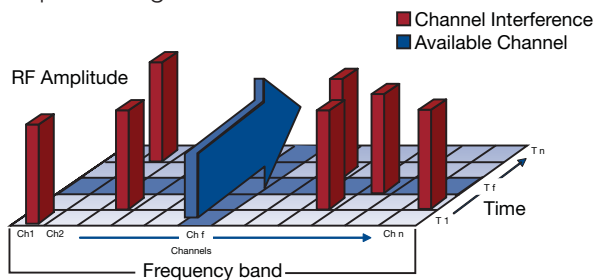
The 915U-2 combines all the benefits of 900MHz, frequency hopping and IP based meshed communications. The throughput and reliability of distance wireless communications is determined by factors including (1) radio frequency (RF) power, (2) receiver sensitivity, (3) modulation technique, (4) ability to self heal/repeatability and (5) frequency waveform properties relative to the terrain.



Relative to higher frequencies, lower frequencies tend to perform better in distant, non line of sight communications. Lower frequencies have less (often single) and smaller channels. Higher frequencies have wider channels and bigger frequency bands allowing greater modulation and data throughput.

The 915U-2 combines high RF power, excellent receiver sensitivity with 900MHz communications providing reliability in non line of sight, distance applications. This is due to the greater diffraction (bending), reflection (bouncing) and less susceptibility to multipath fading of lower frequency waveforms (relative to higher frequencies with the same path).

Modulation techniques/schemes also impact on the reliability of wireless communications. The 915U-2 utilizes Frequency Hopping Spread Spectrum (FHSS) modulation: scanning and hopping through the available channels when communicating and/or experiencing interference.

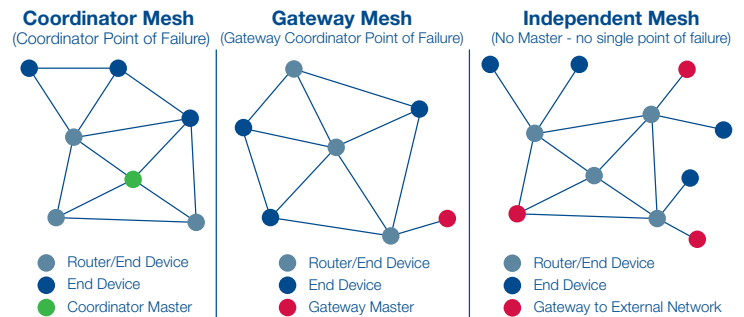


FHSS devices scan the channels (within the band), hopping channels in communicating and/or when experiencing interference.

Understanding mesh technology.

Meshed networks can be classified according to the coordination mechanism and the function/power of each node in the network (eg end node, combined end device/ router of communications and gateway: low or high power etc).

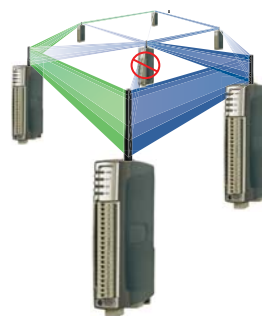
The most common mesh architectures are coordinator, gateway or independent coordination and feature high or low RF power. Both coordinator and gateway networks typically feature low RF power and rely on redundant coordinators/gateways in managing network communications. Over obstructions and/or distance, low RF power will require the insertion of additional network nodes. Coupled with the addition of redundant coordinators/gateways, this adds to the cost of network infrastructure. Independent coordination networks however can be much different.



Coordinator and gateway based mesh networks are low powered and require redundant coordinators or gateways to direct/control communications. ELPRO's innovative WIBMesh™ is independent and automatically detects nodal failure: re-routing communications/maintaining network uptime.

The ELPRO 915U-2 WIBMesh™ advantage.

Derived from the Internet Engineering Task Force (IETF) RFC3561 standard, ELPRO's WIBMesh™ technology provides peer-to-peer (ie no master coordination/control) point to point/multipoint re-routing of communications. This is complemented by high RF power and excellent receiver sensitivity to reduce the need for extra network nodes and reduce overall project costs.



ELPRO's innovative WIBMesh™ technology combines the reliability of 900MHz, FHSS modulation with mesh architecture that automatically routes around nodal failure.

With high RF power/good receiver sensitivity, FHSS, mesh repeatability, the 915U-2 provides reliable, self healed, encrypted distance communications to 115kbps.

- Normal route for communications
- Automatic self-heal/fall over of communications
- Other potential routes of communications.

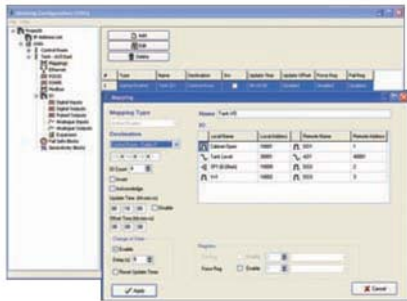
User friendly, cost effective operation.

Feature rich, the 915U-2 allows end users to have combined I/O and/or gateway functionality: users simply purchase a license key for features as they are required in the application.

915U-2 Meshed Multi I/O & Gateway

User friendly configuration: cost effective commissioning and integration.

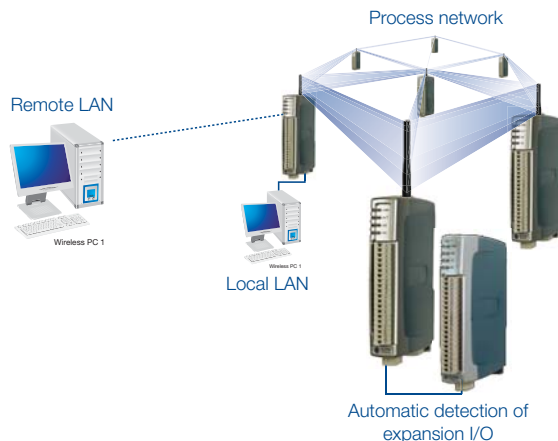
Configuring and commissioning time/effort on the 915U-2 has been designed for ease of customer use and cost savings during commissioning. The WIBMesh™ configuration utility allows for simple nomination of I/O points origin and destination with WIBMesh™ automatically detecting and routing the most efficient path to the destination node. This is complemented by periodic interrogation for optimal path verification, quick recovery of network communications and automatic detection of expansion I/O (ELPRO's 115S). WIBMesh™ also incorporates efficient 'change of state' radio communications and user configurable I/O or register periodic reporting of link status (ie update time). All combine to ensure the user is in charge of network communications.



Configuration is user friendly by nominating and labelling origin and destination points and WIBMesh™ finds the most efficient route.

Remote/local configuration, upgrade and analysis.

ELPRO's WIBMesh™ IP based addressing further aids in cost reduction providing remote analysis and/or upgrade. A user may perform remote or local over the air re-configuration and interrogation of nodes for diagnostics and firmware upgrade. User nominated localized referencing of I/O and system wide network viewing aids in fault analysis and exporting/printing of node configuration is supported.

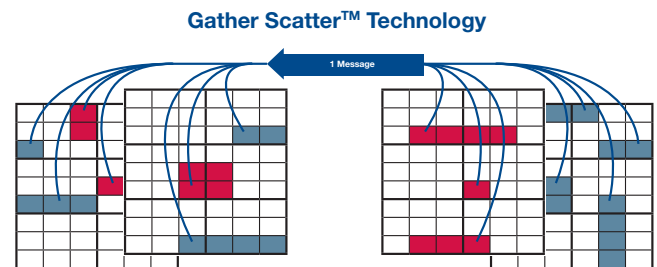


Local/remote over the air re-configuration, firmware upgrade and fault analysis with automatic detection of expansion I/O to reduce overheads.

Quicker, more cost effective commissioning.

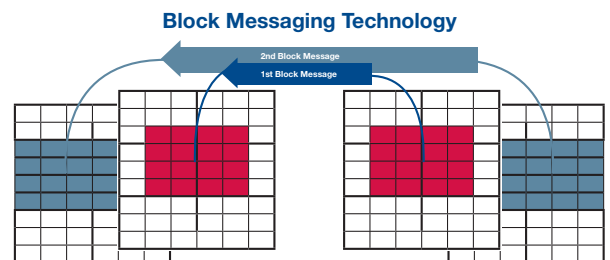
Radio network efficiency and commissioning of the 915U-2 into legacy process control/automation networks is aided with Gather-Scatter™ and block messaging technology.

Gather-Scatter™ technology allows end-users to gather related, non-contiguous data points/registers, into a single radio message structure and scatter these points at receiving devices for ease of integration (eg PLC logic, SCADA tags).



Gather Scatter™ enables non-contiguous data to be transferred between network devices reducing re-programming time and associated costs.

Gather-Scatter™ is complemented by block messaging technology allowing end users to select continuous, related, I/O and registers for forwarding to receiving devices in a single message. Both Gather-Scatter™ and block messaging combine with highly efficient 'change of state', dense capacity radio messaging capabilities in providing scalable system design for ever growing application needs.



Block messaging communicates continuous blocks of data improving the efficiency of radio band use and even more scalable network design.

Cost effective, distance IP based mesh networks.

The 915U-2 combines distance, 900MHz, IP mesh communications with ease of configuration, local/remote over the air re-configurability, firmware upgrade and diagnoses of nodes in the network.

Featuring ELPRO's WIBMesh™ technology with its innovations in network communications efficiency, the 915U-2 provides for scalable network design for process control and automation base applications.

Wireless Specifications			
Frequency band	902-928MHz (sub bands available: country regulation dependent).		
Modulation	Frequency Shift Keying (FSK) : Frequency Hopping Spread Spectrum		
Radio Data Rate	19,200bps baud: 28,800, 57,600, 115200 kbps (pending)		
Channels/Hop Sets	50 x 250kHz; 2 frequency channels .		
Receiver sensitivity	-109dBm; FER = 12%		
Transmit Power	USA: 1W: AUS/NZ: 1W		
Line of sight range	USA: 20 miles: AUS/NZ: 32km		
Antenna connector	SMA female		
Industrial Protocols			
Protocols supported	WIBMesh™, Modbus RTU, Modbus TCP		
Discrete and Pulse I/O			
Digital I/O	8 x D I/O (configurable as inputs/outputs)		
Pulse I/O	D I/O 1 - 4 configurable as PI or PO		
Digital Inputs:		Digital Outputs:	
On-state Voltage	<2.1VDC	DO Max voltage	30VDC
Wetting Current	5mA	DO Max current	200mA
Max I/P Pulse Rate	DI 1,2: 50kHz DI 3,4: 1kHz	PO Max rate	10 kHz
Min I/P Pulse Width	DI1,2 10 µS PI 3,4 0.2 mS		
Analog I/O Digital Outputs:			
4 AI (2 differential: 2 single ended)		2 AO (sourcing)	
Analog Inputs:		Analog Outputs:	
Current Range	0-24mA	Current Range	0 -24mA
Current Resolution	14bits	Current Resolution	13bits
Accuracy (Current)	0.1%	Accuracy	0.1%
Voltage Input Range	AI 1,2: 0-25V AI 3,4: 0-5V		
Voltage Resolution	14bits		
Accuracy (Voltage)	0.1%		
Option Upgrades			
Industrial Protocols			
915U-TCP	Modbus TCP/RTU		
Reported Diagnostics			
LED indicators	Power, RF, RS232, RS485, D I/O (P I/O), A I/O.		

Security and Configuration	
Data encryption	ELPRO 64bit; 128bit AES
Password	https accessibility
User Configuration	Web page; software configuration
Power Supply	
Nominal supply	15 to 30VDC; over / reverse voltage protection
Quiescent current draw	220mA (Idle)
Transmit current draw	500mA
RS485 Power	1 A, 13.8 VDC (for external powering of expansion I/O)
Ethernet Port	
Standard	10/ 100 BaseT; RJ45 - IEEE 802.3
Ethernet LED Indication	Ethernet Link and 100Mbit indication.
Serial Port	
RS232	EIA-562 (RJ45 connector)
RS485	2 pin terminal block
Data rate configurable	110 – 230400 baud (bps)
General/Compliance Specifications	
EMC	EN 300 683; FCC Part 15; AS 3548; 89/336/EEC
Radio	FCC Part 15.427; AS 4268.2; RFS29 NZ
Hazardous area	CSA Class I Div 2 (pending); ATEX; IECEx (pending)
Safety	IEC60950
Size	5.91"x 7.09" x 1.38" (180 x 150 x 35 mm)
Housing	IP 40, High Density Thermoplastic
Mount	DIN rail
Terminal blocks	Removable Terminals to 12 AWG (2.5mm²) conductors
Temperature	-40 to +140 °F, -40 to +60°C
Humidity	0 – 99% RH non-condensing
Weight	500g (1.1 lb); 600g (1.3lb) boxed

Order Code	Description	Frequency	RF Power
915U-2	Wireless Mesh I/O	902-928MHz FSK	1W
915U-TCP	Modbus TCP/RTU Gateway	N/A	N/A
915U-TCADP	TCP Adaptor (Type T thermocouple)	N/A	N/A
Note: Specifications subject to change; country regulation dependent. RF power and frequency may vary depending on country of application.			

Please Note: Technical specifications are subject to change without notice and are correct at time of publishing. Contact your local representative for enquiries.

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